

Alaskan Transportation

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Local Technical Assistance Program

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Mobile Cone and Sign Storage

As Steve Potter, equipment operator for DOT&PF's Northern Region Maintenance & Operations in Fairbanks, watched workers set out and pick up cones and signs for mobile work zone traffic control, he noticed a few things. First, there was no place to efficiently store cones, signs, and sign stands—they got jumbled up in the bed of a pickup. It was awkward for workers to lift the heavy signs and stands over the side of the bed to place the signs, and the same was true of replacing the signs. Cones would get stacked together and then signs and stands would fall over on them. Second, people had a

tendency to throw trash into the bed of the pickup. It was messy. He saw a need for a better way to handle the cones and signs and penned a conceptual drawing.

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Mike Albright stands next to the truck he modified for traffic control devices.

1998 Concept Trucks Get Mixed Review at Alaska DOT&PF

The Alaska Department of Transportation and Public Facilities (DOT&PF) placed two "concept trucks"—beefed-up snow plows for mostly rural operations—into service during the winter of 1998/99. The goals behind the concept trucks were two-fold: (1) solve an overloaded front axle problem caused by putting all the snow-removal components on a truck with a too-small front end, and (2) try out new technology. Be-



sides the concept trucks that came directly from the manufacturer with all components installed, workers added a few features to a couple of existing Freightliner 6x6 trucks. See volume 23, number 3, fall

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Concept Trucks

continued from page 1

1998, October-December issue of this newsletter for the original article. This article deals with only the concept trucks.

Alaska DOT&PF joins other highway agencies in their desire to combat winter's snow and ice for the travelling public and being safe, productive, and efficient. While Alaska is going it alone with primarily maintenance funds and expertise, Iowa, Michigan, and Minnesota formed a consortium and pooled their funding and expertise resources via a research project. Their concept vehicle project is coordinated through Iowa's Center for Transportation Research. They produced dream plows similar to Alaska's concept trucks. Wisconsin and Pennsylvania are also using prototype trucks. Stateside plows have more high-tech equipment (such as weather and temperature sensing equipment, satellite dishes, and voice-activation) on board, mostly because their telecommunication and satellite links are better than Alaska's, where communication is often spotty because of terrain and location. For more information about the stateside dream plows, go to <http://www.dot.state.ia.us/concept.htm>. You'll find a final report on phase one of the consortium's concept highway maintenance vehicle, concept vehicle components, and photos.

Alaska's concept trucks have been around long enough now for operators, foremen, and mechanics to form opinions. As with any new endeavor, there



The hydraulic pump location is awkward for mechanics.

proved to be both good and bad features in the components that make up the truck.

Alaska's concept trucks include:

- 6 x 6 Freightliner truck model FLD120SD with Detroit Series 60 engine, 430 horsepower, Allison World transmission (bigger and higher-powered than previous trucks)
- Wing blade on a rear-truck mount (mounting posts attach just behind and just in front of the rear dual wheels) instead of near the front of the truck, to reduce front-axle weight
- Polyethylene-lined reversible plow (also known as a butterfly plow because of its shape) on the front, instead of an angled, or one-way, plow that goes only one direction.





Above: a sander spinner on the left front.

Below: The patrol wing plow on the right side.



- Twelve-foot Monroe belly blade, model number 2512-0
- Monroe Radius Dump Sander with a U-shaped box, which sits lower on the truck chassis, lowering the truck's center of gravity by 1.5 feet and making the truck more stable
- The sander box moved rearward on the truck frame to reduce front-axle weight
- Dump box with a hydraulic cylinder underneath to raise the box, and a rear gate for dumping the load of sand if necessary
- Sander spinner on the rear, and mid-truck on the front
- New hydraulic system combined nine levers into four-way rocker switches (to move the plow up, down, right, left) on four joysticks; operated by a vane, or rotary style, pump
- Bigger, size 445 tires on the front axle; tires were siped in the center and studded on the outsides for winter use (former trucks used size 425 tires)
- Shortened plow hitches and shortened push arms (gets the plow closer to the truck to reduce front-axle weight)
- Rear intrusion alarm
- Chemical tank for pre-wetting activities

The two concept trucks came straight from the manufacturer, had a thorough checkup and fine-tuning by mechanics before hitting the field, and both went to rural places with significant winter snows, winds, and avalanche potential. One concept truck went to Thompson Pass, just north of Valdez. Thompson Pass averages over 600 inches of snow per year. The other concept truck went to Girdwood, a maintenance station at the outskirts of Anchorage's urban area. Snowfall there ranges from 90 inches to 242 inches a year. The truck assists occasionally in Turnagain Pass, which gets 420-plus inches.

Before the concept trucks got sent to the outlying areas, mechanics faced a fair amount of troubleshooting, primarily on the added components. According to Jerry Reed and Bill Mowl, transportation maintenance superintendents in Central Region, mechanics had to work the bugs out of the electronics controlling the automatic sanding/liquid application system. They also had quite a time troubleshooting the distribution of

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hydraulic output between the sander and the other attachments. The dump box was mounted with inadequate hydraulic hose and electrical wire lengths, preventing the dump box from going all the way up. Hoses, wiring, and other components came mounted on the frame rail—instead, they need to be mounted inside or underneath the frame rail. That allows plywood to be placed on the rail to cover truck components so sand and chemicals don't fall on them.

In other mechanical aspects, though, the trucks have proven to be mostly trouble-free. While that could well be because the trucks are still relatively new, it also means they are sound vehicles.

Overall, operators are generally pleased with the trucks. During winter plowing, a Girdwood operator was able to go uphill in Turnagain Pass while using the front plow, belly-blade, and patrol wing in the down position—all at the same time. But there are ways to improve the trucks.

Operators, foremen, mechanics, and managers readily shared their thoughts about the trucks. Opinions focus on: (1) what works well, and (2) awkward features or absolute failures.

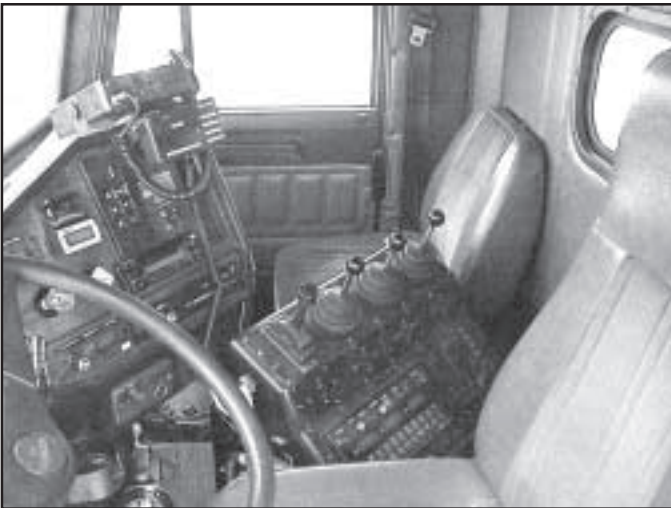


The way the front plow attaches is a minor annoyance.

What Works Well

The truck's best feature is its **ability to perform all functions at once**—plow, belly blade, wing, and apply salt and magnesium chloride.

The **patrol wing plow** on the right side has worked out very well. It allows the operator to do the work of two vehicles because they can clear the road in front of the truck as well as attack snow on the side of the road. It's also much faster than using a grader. The only thing to keep in mind that it is specifically a patrol wing, not a benching wing (the toe of the blade raises only 8 inches off the ground, which isn't high



The hydraulic system in the concept truck combined nine levers into four-way rocker switches (to move the plow up, down, right, left) on four joysticks.



On a different truck, an in-cab control on a single joystick (called a Command-All).

enough for clearing berms or guardrail). Drawbacks are discussed in the next section.

The **belly blade** discharges in front of the wing blade, enabling the operator to plow, scrape, wing, and sand in one operation. But, it has drawbacks, which are discussed in the next section.

The **six-wheel drive** offers solid power and gets through heavy snow conditions.

The **reversible, polyethylene-lined front plow** is an excellent design. Its design and coating cause it to cast snow very well while using less horsepower. Another benefit relates to the shape of the plow—it's contoured somewhat like a butterfly, with high sides and a lower center section – so that very little snow comes over the plow when it's motoring down the road, plowing snow. Just a little snow comes over the lower center section.

The **Monroe Radius Dump Sander box** has worked well—however, Central Region noted they never had any problems with their standard V-Boxes. Jerry Reed says he thinks this says more about the quality of their sand than the design of the sander box. Mark Walker, foreman at the Thompson Pass maintenance camp, reports the operators like the ability to reverse the conveyor that feeds the front or rear sander from the cab. Again, though, there are down sides to this component.

Operators like the **rear dump feature** for emptying the sander at the end of their shift if they have leftover sand. It is much more efficient than auguring the sand out. It also makes for easy access to clean under the unit when sand builds up. It's impractical, however, to use this unit as a standard dump truck because the grizzly isn't easily removed, the belt chain guard is nearly impossible to install, the magnesium chloride tanks have to come off, and the rear spinner has to be removed for ground clearance.

What Didn't Work So Well

Valdez mechanics say that the **front post of the rear-mounted patrol wing plow** needed beefing up to handle the stress of the wing versus the truck weight. The rear mounting of the wing, which does an excellent job of picking up the snow pushed out by the belly blade, has a tendency to push the rear of the truck toward the centerline when the wing encounters

a hard-packed snow bank or other obstacle. Mid-truck mounts are more balanced.

The **belly blade** turntable deck and mounting system are undersized, with parts that come loose or break. Four pivot points aren't enough; Valdez State Equipment Fleet installed a fifth pivot point. The transfer case position needs to be considered when mounting the belly blade to keep it from coming into contact with the transfer case.

The **front plow** is suspended with a chain, attached to two spots on the plow, then looped through a ring hanging from the center of a hydraulic ram. The idea is for the plow to self-level during use. Girdwood noted a problem arises when the operator roads the truck with the plow lifted: one side or the other tends to drop, causing the corner of the blade to drag on the ground; the side it digs in on depends on which way it's angled. Thompson Pass's Walker, whose truck has now an angled plow, thinks the **hinge point on the front plow lift** might be too close to the truck, causing the right plow tire to be in constant contact with the ground.

Converting the trucks to a 6x6 made them higher from the ground, increasing the leverage point on the **front plow hitch**. The hitch-to-frame mounting points need to be trued and bolt holes straight to prevent shearing. Because the mounting arms were bending due to leverage on the front plow, mechanics installed push arms from the bottom of the plow hitch rearward beneath the truck to the belly blade mounting brackets to increase strength and keep the mounting frame from bending downward.

The **combination dump/sander** can be too heavy. Walker noted that it causes the truck to be under-powered on a seven-mile-long 6% grade. The transmission doesn't downshift properly and it overheats. In a situation like Thompson Pass with long, steep grades, mechanics noted the combined dump box/sander weight should be matched to the transmission gearing. And the vehicle should have ample horsepower.

The **left front sander spinner** works okay but the reversal system when switching between the rear and front systems is so slow, sanding usually happens from the rear. At higher settings, the rear sander covers both lanes anyway. Central Region tried to use this feature

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in the summer to fill shoulders, and discovered that it was just too slow to be efficient.

Mechanics don't like **where the hydraulic pump is mounted**—sandwiched between the dump box and truck cab, it's difficult to work on. Front-mounting it on the engine would be a cure.

The **hydraulic system** on Girdwood's truck uses a priority of air controls over hydraulic valves, and it takes 110 lbs. of air pressure to run any of the hydraulics. It also runs off the transmission, which has gear reductions, so the engine has to be revved in order to move any of the hydraulic components. Losing the air means you can't do anything until the hose is repaired. If you lose a brake line or have an air leak in any part of the system, you can't use any hydraulic attachments because the air can't keep up. Thompson Pass's truck is electric over hydraulic, so it doesn't have the problems that Girdwood's has.

On a different truck, Girdwood put in electrically operated hydraulic valves and a piston pump, with an in-cab control on a single joystick (called a Command-All), instead of the four separate joysticks. The hydraulics work faster than the concept truck because the pump runs off the crankshaft of the engine instead off the transmission. It also yields 90% flow at an idle so the engine doesn't have to be revved to operate the hydraulics.

The **collision-avoidance system** is a good idea, but the system never worked very well. It often doesn't pick up the objects in the truck's path.

The **four joysticks** are not as efficient as originally thought. The position of the joystick console in the cab puts the operator's body/arm movement at almost 90 degrees from the normal front-facing position. And the operators have to concentrate on which stick to grab, a tough thing to do when you have to react quickly. Operators also prefer a one-stick command module for controlling all the hydraulic components.

The **sander control LED display** in the cab is located down and to the right of the operator, where it is hard to see. A location for better operator visibility is on the dash in front of the operator where it could be seen at a glance.

General observations: (1) Visibility on the wing side of the truck is poor. (2) Mechanics say it's difficult to service the lubricants on the truck. (3) The abundant electronic systems are hard to maintain and difficult to troubleshoot. (4) Operators don't like the layout of the controls, the lack of rearward seat movement (a necessity for long-legged people), and the slow hydraulic response at anything less than high RPMs. (5) The heater/defroster draws only outside air, which pulls moisture into the cab and fogs up the windshield when temperature/wind/snow conditions are right. It needs a control allowing the operator to choose from outside air or recirculated air. (6) Exposed hydraulic lines could be a nightmare if the truck is in an area with -30F to -40F temperatures and 50 mph winds.

Cautions

These plow trucks are better for maintenance camps on the highway system, away from urbanized areas. The width of the front plow, combined with the patrol wing on the side, makes the truck inappropriate to use in high traffic, narrow lane areas—such as downtown urban areas.

Thanks to those in Alaska DOT&PF Maintenance & Operations and State Equipment Fleet who contributed information and critiquing for this article: Mark Walker, Thompson Pass; mechanics in Valdez, Marty Caress and Ken Chase, Cantwell; Joel Craft and Tom Victorino, Fairbanks; Andy Hibbs and Larry Bushnell, Girdwood; Bill Mowl, Anchorage; and Jerry Reed, Anchorage, who also provided photos.



Mobile WZTC Cone and Sign Storage

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Steve Potter, who did the conceptual drawing, won an award for designing a better way to store cones and signs.

Mike Albright, another Fairbanks operator, took Potter's concept drawing and went to work. He built storage components into the flatbed of the truck specifically to accommodate setting out and picking up cones, signs, and stands. By putting their heads together, Potter and Albright developed a safer and more efficient means for their traffic control workers to deal with cones and signs. Clutter no longer builds up in the bed of the pickup because the flatbed is, in a word, flat. The flatbed has no sides, so there's no lifting over the side to dump the signs, etc., into the bed or to get them out.



Cones are stacked on raised pinnacles.

The bed is aluminum, and is customized for specific work zone items. The stand holders and sign racks are steel. Albright produced raised pinnacles to stack cones, recessed containers for sign stands, and racks for the signs. They put these components on a truck that can also be used as a pilot car. It has cautionary lights on a headache rack just behind the cab. Materials costs for the aluminum and steel run about \$1,500, according to Albright. Northern Region is now building its third work zone traffic control (WZTC) truck.

Potter, who was nominated by his supervisor, recently received an AASHTO award for recognizing the need for a safer, more efficient way to deal with the tools used in traffic control and then using his can-do ability to conceptualize the drawing. Albright deserves kudos as well for manufacturing the truck.

For a copy of the drawing (this is not an engineer's or Autocad drawing; it is hand-drawn) and specs, contact Potter or Albright at 907-451-2205 or e-mail Joel Craft, Fairbanks area manager:

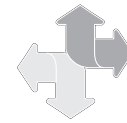
Joel_craft@dot.state.ak.us



Clutter no longer builds up on the bed of a flatbed that has no sides



New Roadway Uniformity Manual Ensures Safety Nationwide



Fredericksburg, Va.—The U.S. Department of Transportation recently released the Millennium Edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). This new manual contains detailed roadway standards for the entire transportation industry to follow across the country, to uniformly control road signs, roadway work zones, traffic control, highway rail crossings, traffic control for bicycles, and more. Uniformity in all of these areas is essential to ensure maximum safety nationwide, for both roadway workers and motorists.

The original MUTCD, first published in 1935, was revised in 1978 and again updated in 1988. Several of the changes in the Millennium Edition of the MUTCD include:

- New signs and pavement markings to improve roadway safety and efficiency;
- Changes in standards and guidance to provide for the needs of older drivers;
- New sections, including Part 5 (rural roads) and Part 10 (light rail);
- Major changes in Part 6 (work zones) to reduce delays in and around road work zones;
- Additions to incorporate provisions of the Americans with Disabilities Act; and
- New provisions to assist pedestrians and bicyclists.

"ATSSA members are committed to helping make roadways safer for all motorists. We're excited that the new manual will give each of them up-to-date guidelines to abide by across the country when installing and maintaining roadway safety devices such as signs, or when managing roadway work zones," said Roger Wentz, ATSSA's executive director.

The American Traffic Safety Services Association (ATSSA), partnered with the Institute of Transportation Engineers (ITE) and the American Association of State Highway and Transportation Officials (AASHTO), to publish the new manual and make it available to the roadway industry. The partnership with ITE and AASHTO allows ATSSA to make the manual available in many different versions to suit the needs of the diverse transportation industry.


The first version binds each chapter of the manual separately. This three-hole-punched product easily fits into a binder, allowing users to remove old information and insert changes and updates as they are published.

The second version is a perfect-bound, three-hole drilled book, which also fits into the three-ring binder. This version of the manual is the most complete, since it contains all 1,100 pages in one bound book.

ATSSA is already accepting pre-orders for the first two versions of the MUTCD at the Products Department link of www.atssa.com. ATSSA will also offer further discounts for manuals ordered in higher quantities. The anticipated shipping date for all orders will occur shortly after March 30.

The third version of the manual will be released on CD-ROM, which will enable users to search, copy, and paste the text of the document. The CD-ROMs will be available after March 1.

The fourth version is a "glove box size" MUTCD. This version contains select portions of the MUTCD that roadway workers require on a daily basis while on the job in the field, such as Part I, V and VI ("Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility, and Incident Management Operations").



In addition to the new MUTCD, ATSSA continues to offer a wide variety of products and materials at the Products link of www.atssa.com

Potential purchasers of the new MUTCD who do not have Internet access may order the product by contacting ATSSA toll free at (877) 642-4637, ext. 135.



PNS Snow Conference

Registration is now available online for the PNS Snow Conference on May 29, 30, and 31, 2001 in Kelowna, BC.

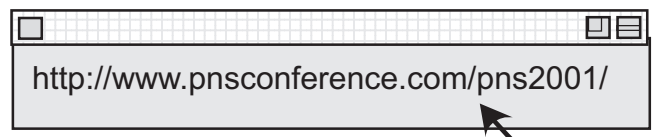
This conference offers an exciting technical program of the latest cutting-edge research and practice, as well as a first-class tradeshow that provides a viewing of the latest in equipment.

Last year's participants will tell you that informal discussions are an integral part of the conference, and the conference organizers have assembled a set of supporting events and activities that provide excellent opportunities for meeting colleagues and sharing ideas and perspectives.

The technical program will provide information for all levels of professionals including operators, supervisors, managers, consultants and researchers.

Be aware that the Grand Okanagan Resort Hotel where the venue occurs books up very quickly and you need to call there on the toll-free number listed on the website and quote the PNS conference.

Please go to this site for all information and registration:



National Work Zone Awareness Week 2001

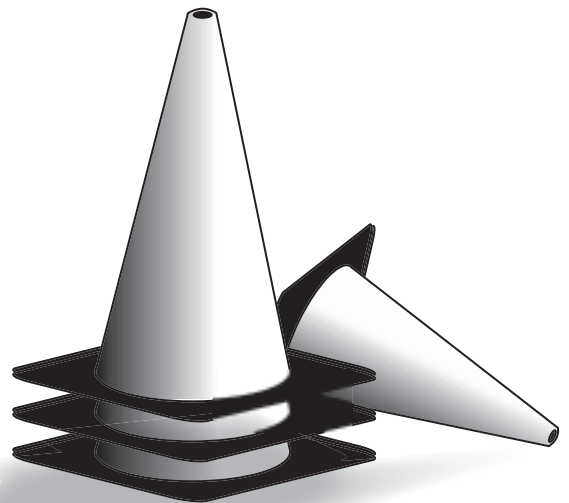
This year's National Work Zone Awareness Week will be held the week of April 9–12, 2001. A kick off media event will be held on Monday, April 9, at the National Mall in Washington, D.C., 9 a.m.–3 p.m. The event will include a memorial to the 868 people who were killed in work zone related crashes in 1999.

A display of 868 highway cones, each draped with a black ribbon, will symbolize a worker or motorist killed in a work zone related crash.

A tent will be set up on the National Mall where partners in the highway safety community will have an opportunity to talk to the public about what they are doing to make work zones work better, be safer, and also what drivers and pedestrians can do to help ensure safe travel in and around work zones.

The first National Work Zone Awareness Week was held April 3–7, 2000. The establishment of this Awareness Week was accomplished by a Memorandum of Understanding (MOU) between the American Traffic Safety Services Associa-

tion, the American Association of State Highway and Transportation Officials, and the Federal Highway Administration. This MOU created a partnership among States, industry, and the federal government.



National Transportation Week

National Transportation Week provides an opportunity for the transportation community to join together for greater awareness about the importance of transportation. National Transportation Week also focuses on making youth aware of transportation-related careers.

National Transportation Week May 13-19, 2001

In recognition of the importance of our Nation's transportation system to our national security and economic health, and in honor of the many dedicated men and women who have ensured its continued excellence through the years, the United States Congress, by joint resolution approved May 16, 1957 (36 U.S.C. 120), has designated the third Friday in May of each year as "National Defense

Transportation Day" and, by joint resolution approved May 14, 1962 (36 U.S.C. 133), declared that the week during which that Friday falls be designated "National Transportation Week."

—Proclamation of President William J. Clinton
May 15, 2000

To contact the National Transportation Week organization, use the information below.

National Transportation Week
4600 North Fairfax Dr
Suite 800
Arlington, VA, 22203
1-877-558-6874
info@ntweek.org



Changes to APWA Winter Maintenance Web Site

Due to some changes in the appearance and content of APWA's web site, its winter maintenance subcommittee's web pages have been inactive for some time. They have updated the site and it is now reactivated.

While I encourage you to peruse all of APWA's site at <<http://www.apwa.net>>, you can directly access the winter maintenance subcommittee site at <<http://www.apwa.net/About/PET/Transportation/Winter-Maint/index.asp>>. Please use this latter URL if you have linked other sites to ours.

I also call your attention to a "Resource Input Form" which can be accessed via the site. It will be our instrument for obtaining input on content and resources for a supplement we will prepare to the

"Guide for Snow and Ice Control." This supplement will be focused on local governments and urban areas. Please consider submitting your thoughts and ideas on content and/or possible contributors to this proposed supplement.

Our web site task force chairman, Gary Vandegriff, City of Indianapolis or I would appreciate hearing any comments or constructive criticism you may have regarding this site.

Thanks,

Larry Frevert, Chairman

APWA Sub Committee on Winter Maintenance



Alaska DOT&PF Announces New Research Projects

Developing Rapid Assessment Protocol for Highway Culverts

In Alaska, highway culverts are adversely affecting safe fish passage in some watersheds. Alaska currently has an unknown number of culverts that present a full or partial barrier to fish passage. DOT&PF recently established an annual project, to be jointly performed by DOT&PF and Alaska Department of Fish and Game, to repair or replace culverts that block or impair fish passage. However, without an accurate estimate of the problem, precise funding is difficult to program. DOT&PF does not have a good estimate of the number and physical attributes of problem culverts along our highway system. DOT&PF also does not have a procedure to identify and prioritize the repair or replacement of culverts that block fish passage for adult or juvenile salmon.

We will develop and validate a "rapid assessment protocol" to identify and prioritize repair and replacement of problem culverts. The protocol will narrowly define the parameters to evaluate in assessing problem culverts, to support rapid decision-making. Collected data will be incorporated into a database that will integrate with DOT&PF's AutoCAD design systems and information systems used by the state's resource agencies. Potential parameters for the protocol include items such as outlet height, velocity, upstream habitat, fish species, stream gradient, outlet/inlet control, and channel width. The project scope will initially be narrowed to the Kenai Peninsula for a phased approach to statewide development of the rapid assessment protocol. We expect completion around September 2002.

Water Drainage from Thaw Basins

In Alaska, we all too commonly have to construct roads and airports on frozen ground. Embankment construction on top of frozen soil disturbs the ground thermal regime and results in accumulated water below the embankment toes. We propose to find a solution to this problem by adequately diverting water from these problematic areas. The possibility of using, for instance, gravel columns, geosynthetics, or an innovative ditch construction method will be explored.

Based on what we learn, design criteria will be developed for use by DOT&PF engineers.

The final product of this proposed research will be in the form of drainage-related design criteria that will be added to DOT&PF's current embankment design criteria. We anticipate results by September 2001.

Frost Effects on Low-Volume Roads

Alaska DOT&PF constructs many low-volume roads using materials adjacent to the embankment. Too often, these materials don't perform well. The current focus in Alaska is to reduce maintenance costs by applying surface seals, generally to existing roads. In many cases, these roads must be spread and reconstructed if they are to perform adequately. In other cases, they perform well even though the design violates our current design procedures. This project aims to learn how to use marginal, potentially frost susceptible soils in these roads without compromising performance and to improve existing roadway embankments without going through complete reconstruction.

As existing material sources are depleted and environmental constraints increase, high-quality materials sources become more difficult to obtain. Consequently, Alaska is forced to use lower quality aggregates in roadway construction. This often results in either reduced performance or the need to use stabilization techniques.

This study focuses on three major efforts:

- DOT&PF design procedures will be reviewed for their application to low-volume roads and changes will be recommended based upon this review.
- We will review and test methods to improve the quality of the available aggregates. Methods include waterproofing, stabilizing, and use of open graded material, among others.
- We will investigate inexpensive and rapid methods to estimate the frost effects on soils. Such methods may include dielectric methods, centrifuge methods, and measurements of soil suction.

This work will take place on future road projects, and we expect to report results in about September 2002.



Anti-Icing/RWIS Training Goes Nationwide

"How do you train people to use anti-icing techniques and RWIS [road weather information systems?," asks Lee Smithson of the Iowa Department of Transportation (DOT) and coordinator of the American Association of State Highway and Transportation Officials (AASHTO) Snow and Ice Cooperative Program (SICOP). Until now, each state has tackled this question separately, with some states developing their own training programs and others using materials from product vendors. A new project recently launched by AASHTO, the Federal Highway Administration (FHWA), and a pooled-fund research program known as AURORA, which includes state highway agencies and international partners, will bring these individual strands together into a new nationwide training program for anti-icing/RWIS.

The project's primary goal is to develop an interactive, computer-based training program that will have three operating levels: one level for equipment operators, one for supervisors, and one for middle managers. The program will be based on research done under the Strategic Highway Research Program and the National Cooperative Highway Research Program, as well as such documents as the AASHTO *Guide for Snow and Ice Control* and FHWA's *Manual of Practice for an Effective Anti-Icing Program: A Guide for Highway Winter Maintenance Personnel*. It will cover information needed by all users, such as basic meteorology and chemistry. But it will also go beyond the basics and allow users to customize the program to include such variables as climatic information for their region, treatments for specific local road conditions, and regional and local weather forecasting and monitoring. Users can then perform simulations, selecting

maintenance practices from a range of alternatives and viewing the resulting consequences of their selections.

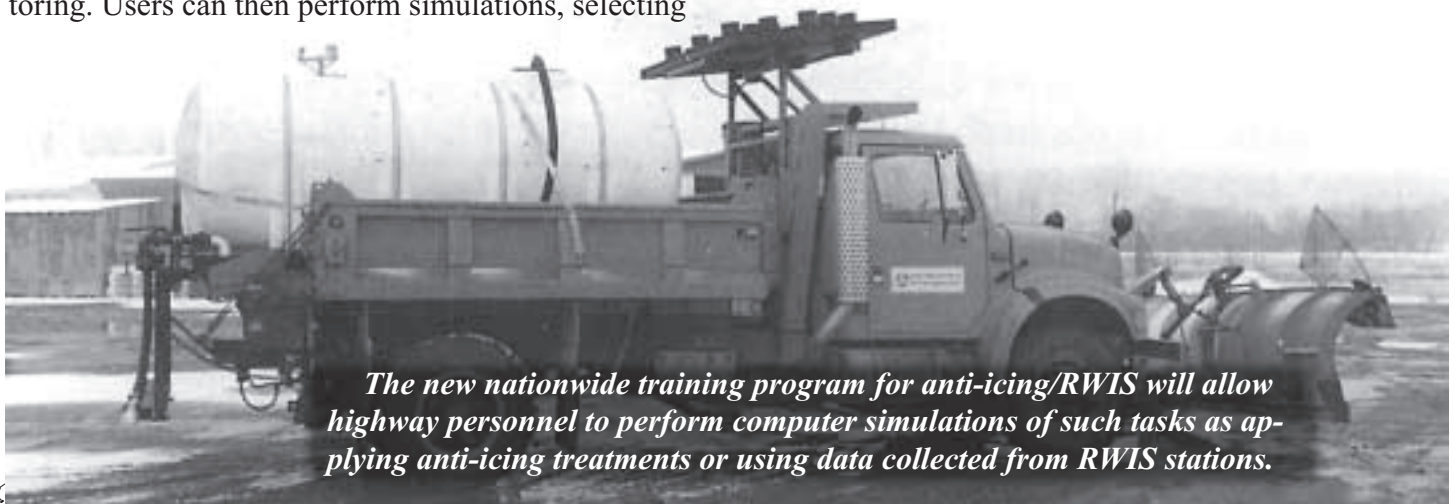
"When we're done, we should have the crème de la crème of anti-icing/RWIS training," says Smithson. "A real advantage of the program will be that it can be used in both a group setting for training and by individuals. An operator could just sit down and go through this independently."

The program's components will also be easy to update, to accommodate future changes or additions to anti-icing/RWIS information.

"This is something that the winter maintenance community has been working towards for a long time," says Paul Pisano of FHWA. "It will provide more consistency in how anti-icing is handled across the country, which will be reflected in what the driving public experiences."

A contract to develop the training will be awarded this fall, with the program scheduled to make its debut in the fall of 2001. The project is being jointly funded by SICOP, FHWA, and AURORA. States, counties, or municipalities who have contributed at the top level of \$30,000 to project funding will receive a program specifically tailored to their state, while others who have contributed at the lower level of \$5,000 will receive a generic program package. Governmental agencies not participating at this time in the pooled-fund project will be able to purchase the program from AASHTO, although a price has not yet been determined.

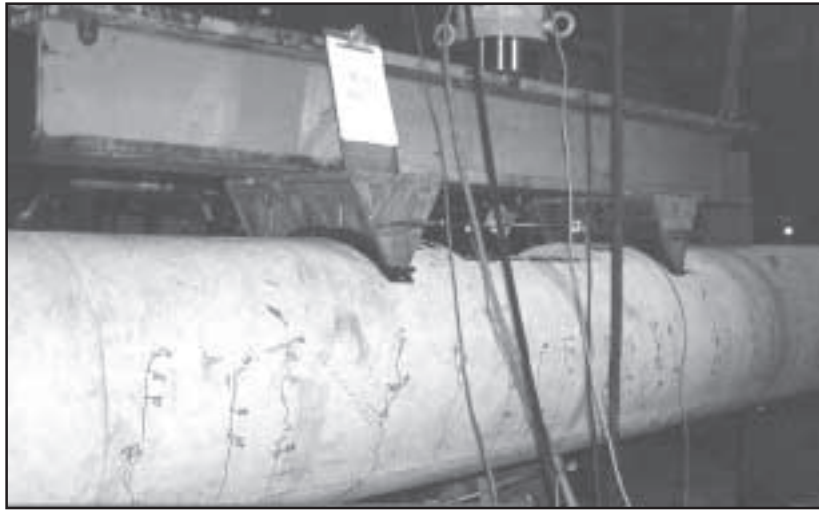
For more information, contact Lee Smithson at 515-239-1519 (fax: 515-239-1719; e-mail: lsmiths@max.state.ia.us).



The new nationwide training program for anti-icing/RWIS will allow highway personnel to perform computer simulations of such tasks as applying anti-icing treatments or using data collected from RWIS stations.

Practical Research Answers Real-life Questions

by Sybil Hatch from Public Roads, November/December, 2000



At FHWA's Turner-Fairbank Highway Research Center, researchers map the cracks caused by incremental loads applied to this 0.76-meter- (30-inch) diameter drilled shaft with a built-in anomaly.

The Federal Highway Administration (FHWA) often develops collaborative partnerships with professional and trade organizations to serve the highway community's best interests. Such is the ease with FHWA's long-standing relationship with ADSC: The International Association of Foundation Drilling.

Through this partnership, drilled shaft technology has advanced by leaps and bounds. Drilled shaft use in highways has doubled over the past decade. Departments of transportation and other public and private sector owners are reaping the benefits.

Drilled shafts often make superlative bridge foundations. They can carry huge vertical loads. They effectively carry large lateral and seismic loads. For many soil conditions, they are easier to install than driven piles and do not create ground vibrations. They can be readily installed offshore and can be made highly resistant to scour. And they are economical.

One perceived disadvantage of drilled shafts is that because the shaft is built in place (as opposed to formed in a casting yard as with piles), it is difficult to monitor the shaft's constructed integrity. But as the level of comfort in using drilled shafts as foundations has increased over the years, so has the sophistication in testing their properties.

"In the early 1990s, states started routinely performing nondestructive testing on their drilled

shafts and noticed some anomalies such as potential voids or discontinuities in the concrete," explains Albert DiMillio, head of the FHWA Geotechnical Research Team.

"As testing has become more commonplace," says DiMillio, "databases of observations have grown, leading to more questions about their performance. That's one of the main areas on which we're focusing our research efforts."

What Causes Anomalies?

Anomalies can be caused by any number of reasons, but to understand anomalies, one needs to understand the basics of drilled shaft installation. First, a hole is drilled into the ground. If the hole cannot stand open on its own, either steel casing or slurry is used to keep the side walls from collapsing into the hole.

A steel reinforcing cage is lowered into the hole, and the concrete is placed. If the hole is filled with slurry, the concrete is placed by using a "tremie" pipe or by pumping from the bottom of the hole upward, thereby displacing the slurry.

In an open or cased hole, free-fall of concrete is the preferred placement method. If the hole is cased, the casing is then pulled out before the concrete hardens.

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continued



Despite care and skill in construction, voids or gaps in the concrete can occur for many reasons. For example, even when using slurry, soil can cave into the concrete. Sediment can be caught in the slurry as the concrete is placed. The reinforcing cage can be out-of-plumb. When extracting the casing, the concrete can adhere to the casing and cause gaps.

How Well Can We Detect Anomalies?

Two concurrent research programs funded by FHWA, ADSC, and others are being conducted to answer this question. One program is at Polytechnic University in Brooklyn, N.Y., and the other is at the University of Houston.

In research led by Dr. Maged Iskander, licensed professional engineer and professor at Polytechnic university, artificial anomalies were installed in six full-scale drilled shafts installed at the National Geotechnical Experimentation Site (NGES) located at the University of Massachusetts at Amherst.

Items such as 1- to 10-gallon (3.78- to) 37.8-liter) plastic pails, foam insulation, 9 to 13 inch (230 to 330 millimeter) diameter cardboard construction tubes, and 4 inch (102 millimeter) flexible drain pipe were secured to the reinforcing cage of 3 foot (0.91 meter) diameter drilled shafts. FHWA provided funding for instrumenting the shafts and helped facilitate the work.

Seven testing organizations, including two universities, tried their hand at detecting these anomalies using various nondestructive testing techniques in a Class-A prediction symposium.

"Although the data are still being analyzed, preliminary results indicate that most large anomalies

were located by all detectors," says Iskander, but there were also) a number of "false positives" showing an anomaly where none actually existed.

Similar research conducted by Dr. Michael O'Neill and others at the University of Houston, also funded by FHWA and ADSC, indicates that the largest void that would go undetected by a well-conceived testing program is one that occupies about 15 percent of the gross cross-sectional area of the shaft.

For a 3-foot-diameter shaft, this equates to a void the size of a 1-gallon paint can. The results were consistent with earlier studies conducted for and by FHWA.

How Do Anomalies Impact Performance?

Finding anomalies is important, but the compelling question is how these anomalies affect the vertical and lateral load-carrying capacity of the drilled shaft. The two current FHWA/ADSC research projects mentioned above are exploring this issue.

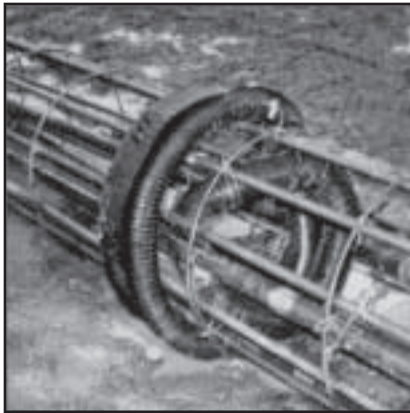
Research at the Polytechnic University involves axial load tests on the shafts used for the prediction symposium. The research is ongoing, so data are not yet available.

The University of Houston load-testing program is further along and results are providing good insight into the structural performance of drilled shafts with anomalies. At the NGES at the University of Houston, six full-scale drilled shafts, each three feet in diameter, were constricted. Five shafts had preinstalled minor anomalies, while a sixth shaft that had no anomalies served as a reference. The shafts were loaded laterally until they approached structural failure.

Initial results showed that the ultimate lateral load capacity was reduced by a maximum of 10 percent. However, after the test shafts were exhumed,



Various items are attached to the reinforcing cage to simulate small anomalies.



Plastic tubing attached to the reinforcing cage simulates "necking" of concrete in a drilled shaft.

inspected, and measured, researchers factored in the reduction in shear strength caused by shaft geometry.

"We found that the maximum reduction in capacity was actually 23 percent," says O'Neill. "But we still weren't satisfied that we fully understood the whole picture. For example, we believed that the anomaly's position within the shaft may also impact its load-carrying capacity."

How Can We Be Sure?

Rather than performing full-scale testing, O'Neill's team set out to determine whether small-scale laboratory shafts adequately simulated large-scale drilled shafts. Lab-size shafts can be built more economically to study the various factors influencing shaft behavior.

O'Neill's team tested 19 scaled shafts to simulate nine or ten anomalies that can be caused by normal construction techniques.

"We determined that an anomaly outside of the reinforcing cage has much less impact than one inside the cage," says O'Neill.

Two full-scale tests were conducted at the Structures Laboratory at FHWA's Turner-Fairbank Highway Research Center on specimens that were identical to the small-scale specimens to evaluate further the effects of scale.

"At the outset, we thought that the lab tests would not be representative because the lab shaft is not

confined by the soil," explains O'Neill. "It turns out that the soil-confining pressure was not important after all when compared with the confinement afforded by the transverse steel in the reinforcing cage."

From the laboratory testing, O'Neill's team could then develop and calibrate a computer model to evaluate other anomaly sizes, geometries, and combinations.

What's the Bottom Line?

In designing drilled shafts, engineers typically use capacity-reduction factors to account for anomalies and other uncertainties. The computer model was used to develop capacity-reduction factors for various combinations of anomalies.

The computer model showed that for the unlikely case of three simultaneous anomalies occurring in a critical section of a drilled shaft, the pure axial capacity would be reduced by approximately 33 percent and the pure flexural capacity would be reduced by 47 percent from the theoretical values for a perfect section.

Intuitively, one expects that the occurrence of three simultaneous anomalies at the critical section along the shaft has a very small probability. Therefore, the next step in the research will be to apply probabilistic studies to refine the deterministic capacity-reduction factors previously calculated.

"The results of our research," says FHWA's DiMillio, "will give designers, owners, and contractors confidence that they are building safe economical drilled shafts that take into consideration the imperfect state of even the most carefully constructed shafts."



New Funding Formula in Alaska's Indian Reservation Roads Program

By Julianne Stevenson, Acting Director, Kawerak, Inc. Transportation Program

The following information is provided as a background for a Notice of Proposed Rulemaking (NPRM) for the Indian Reservation Roads (IRR) program that is to be published in the Federal Register sometime within the next six months. It is in your interest to comment on the Federal Register notice once it is published.

The IRR Program is funded out of the Highway Trust Fund and provides assistance to federal recognized tribes, including Alaska Native villages, in the development of surface transportation systems. Funding for the program has increased over the years to its current level in FY 2001 of \$300 million. Approximately \$17 million in construction funds was available to Alaska in FY 2000. The Alaska Region Bureau of Indian Affairs (BIA) administers the IRR program in Alaska.

In the Transportation Equity Act for the 21st Century (TEA-21), Congress required the Secretary of Interior to use the negotiated rulemaking process to: (1) develop IRR program regulations, and (2) develop a funding distribution formula based on the following:

"The funding formula...shall be based on factors that reflect

- (i) the relative needs of the Indian tribes, and reservation or tribal communities, for transportation assistance; and

- (ii) the relative administrative capacities of, and challenges faced by, various Indian tribes, including the cost of road construction in each Bureau of Indian Affairs area, geographic isolation and difficulty in maintaining all-weather access to employment, commerce, health, safety, and educational resources."

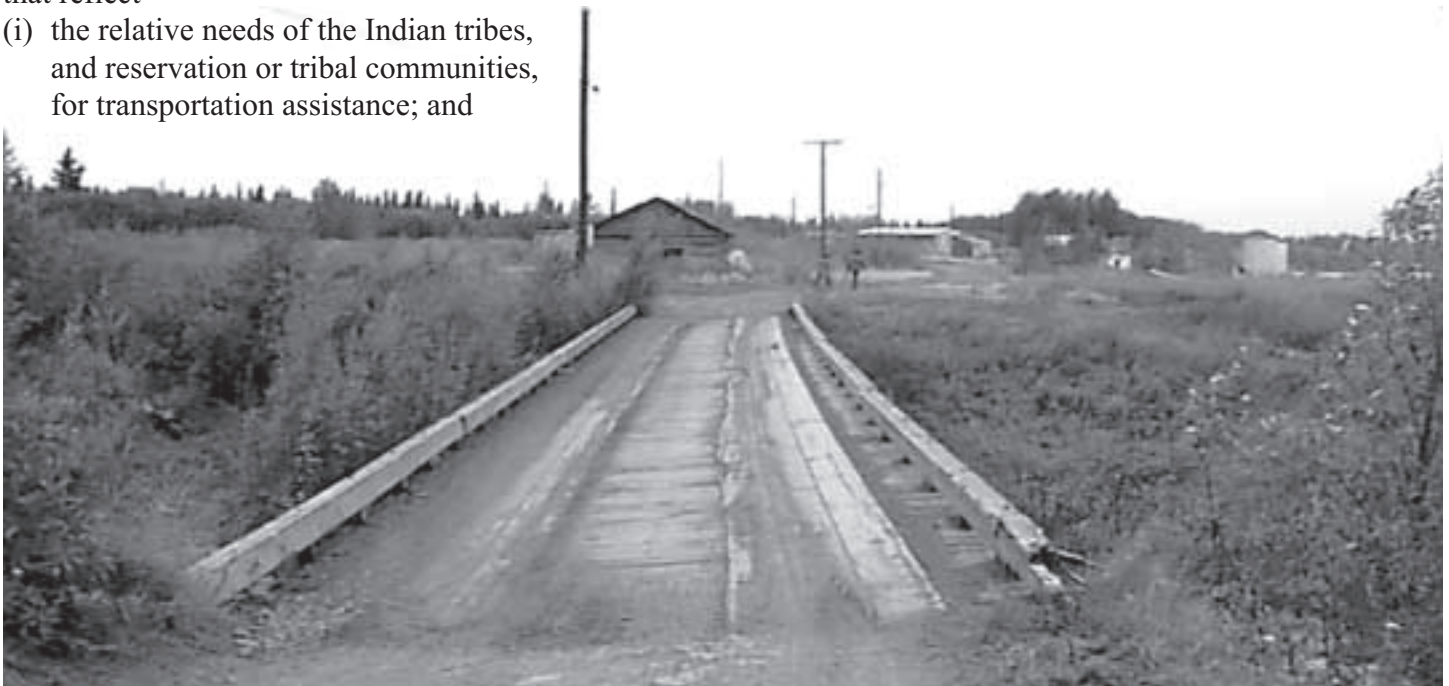
The Neg-Reg Committee completed the proposed regulations in December 2000. They were unable to develop a single formula, so two formulas will be published in the NPRM.

The Alaska representatives on the Committee support the "New Relative Need Formula" (NRNF). The Alaska contingent believes the other formula—the "Modified Relative Need Formula"—is only a slight variation of the formula developed and used by the BIA since 1992.

When the notice of proposed rule is published, the Alaska representatives to the committee will ask all interested entities in Alaska to comment in favor of the NRNF, which has the following features:

- 5% set aside of construction funds for high priority projects.

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- Balance to be distributed:
 - 55% cost-to-construct based on an inventory of identified tribal surface transportation needs
 - 15% minimum allocation
 - 15% population
 - 15% vehicle miles traveled (length of existing road or trail times average daily traffic)

The high priority projects set-aside and the minimum allocation component are new concepts not previously used.

High Priority Projects (HPP)

This is a special funding pool using 5% of IRR construction funds, increasing to 10% in 2004. This pool will be available on an application basis to tribes whose annual allocation under the formula is too small to complete their highest priority project. Projects funded from the HPP program will be limited to \$1 million, and a tribe can only apply for one project at a time. Ranking criteria will give precedence to tribes that have never had an IRR construction project, and to applications that address safety and other factors listed in 23 USC §202(d)(2)(D), which can be found on the web at <http://www.fhwa.dot.gov/legisregs/title23.pdf>.

The Neg-Reg Committee included the HPP program because at current appropriations levels, under any funding formula, most tribes will not generate enough funds to actually build projects in a reasonable period of time. Only 80 or so largest tribes generate enough funds to build projects on a regular basis. The HPP program will allow smaller tribes to apply to a national pool for their most important projects, outside the normal distribution system. Some of the needs of smaller tribes will thus be met every year.

Minimum Allocation

This provides minimum funding for each tribe, depending on population ranges. It will provide at least \$10,000 for tribes less than 25 in population, \$35,000 for tribes between 25 and 100 in population, \$50,000 for tribes between 101 and 1,000 in population, \$65,000 for tribes between 1,001 and 10,000 in population, and \$80,000 for larger tribes.



As a practical matter, any tribe wishing to undertake construction activities must also perform functions such as inventory development, planning, intergovernmental coordination, maintaining management systems, and other preconstruction activities. The minimum allocation component ensures that all tribes have a small but meaningful amount of funds to perform these functions.

The Negotiated Rule-Making Committee will meet to consider the comments to the NPRM. The more comments received in support of the new funding formula, the greater likelihood that it will become the new formula. Support from all sectors within Alaska will be very important. The impact to Alaska of the new funding formula will be an increase of several million dollars per year from the IRR Program.

For more information, contact: Julianne Stevenson, 907-443-9013, julie@kawerak.org; or Bruce Baltar, 907-443-5231, bbaltar@kawerak.org. Both work for Kawerak, Incorporated, in Nome. Other contacts are: Loretta Bullard, Kawerak, Inc.; Al Ketzler, Sr., Tanana Chiefs Conference; Gideon James, Venetie; Dugan Nielsen, Dillingham; and Dan Mareno, Sitka.



Do You Use Salt for Winter Road Maintenance?

If so, consider registering for Transportation Association of Canada's (TAC) new on-line Road Salt Management course.

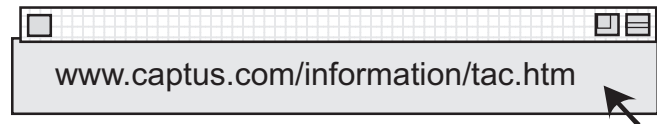
The course's multimedia presentations outline:

- the role of winter maintenance in effective road transportation;
- the pros and cons of road salt use;
- techniques for better road salt management; and
- many other topics of interest to those managing road salt.

The course, based on TAC's Salt Management Guide, also includes quizzes, downloadable notes, and a fully interactive participants' forum to ensure each student has a full understanding of the material.

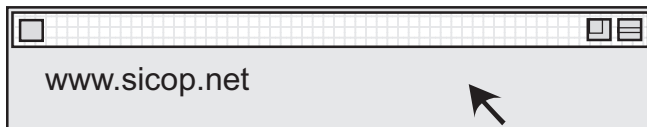
TAC members receive a lower member rate for both the course and the guide!

To preview a segment of the course, free of charge, or to register, go to:



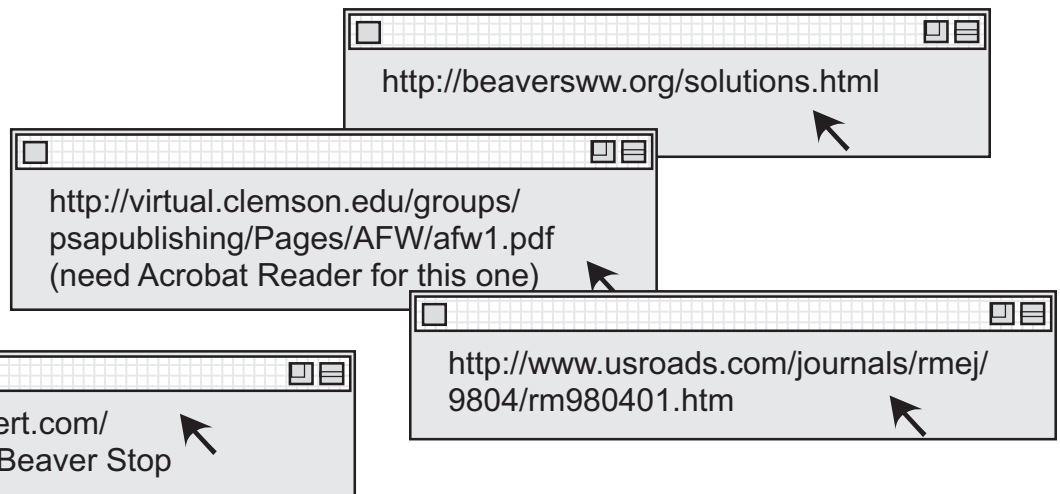
Web Sites of the Quarter

The Snow and Ice Pooled Fund Cooperative Program (SICOP) has established a web site at:



The purpose of the site is to share information relevant to winter maintenance activities in the US. Please visit the site and share it with others. Any comments would be most welcome—please send them to wilfrid-nixon@uiowa.edu.

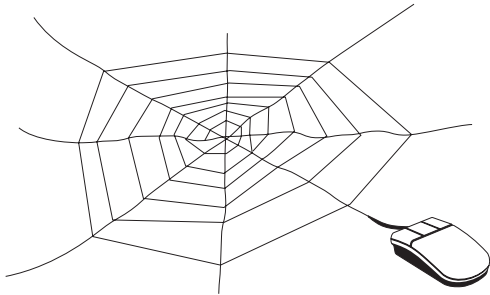
Some new (maybe new, maybe old) information on baffling beavers that like to dam culverts:



Spinning Your Own Web Site:

Part Four, Helping Users Navigate Your Site

From a series of articles about web site development reprinted here with permission from Technology News of the Iowa State University and the Center for Transportation Research and Education.



This is the fourth article in a series about web site development for local transportation agencies. The first three articles covered planning a web site, acquiring the tools for creating it, and choosing and organizing content.

Choosing and organizing content for a web site is a big job. To make sure the visitors to your site appreciate what a great job you've done, you need to label things clearly and well, and provide an easy way for visitors to navigate your pages.

What are Good Labels?

Labels are the names you give to sections of your site and to links within it. See the City of Des Moines web page below. Clicking on the "City Clerk's Office" button, an example of a link label, will take you to a page with the same label. Labels are part of a whole labeling system that should be consistent throughout your site. Good labels are specific and descriptive from the perspective of the site's users. "Employment Opportunities" and "Breaking News!" are specific, descriptive labels that visitors to your site would readily understand. "Engineering Division" may be meaningful to people in your agency, but it doesn't tell outsiders much. Would that link allow users to contact the engineering division or learn more about what the engineering division does?

Problem Labels

One great thing about the World Wide Web is how much we can learn (and borrow) from other sites'

strengths and weaknesses. One metropolitan public works department has developed a well organized site chock-full of helpful content for the public. Labels, however, are not this site's strongest feature.

One problem is the label "Index" on the department's main page. The label sets up specific web user expectations—mainly that the index is an alphabetical listing of main topics or ideas within the department's web site. But this index doesn't fit a user's expectations because it is neither alphabetical nor a consistent listing of main topics. At the time of this writing, the index looked like this:

- Mission/Vision Statement
- Services at a Glance
- Street Closings
- Road EIS Executive Summary
- Snow Emergency Info
- Recycling
- Other Public Works
- Bridge Opening
- News
- Director's Greeting
- Street Construction

If the list were alphabetical, two related ideas such as "Street Closings" and "Street Construction" would be next to each other in the list. As to the link labels themselves, some are specific and descriptive, giving users a clear idea of where the link will take them. "Snow Emergency Info" and "Director's Greeting" are two examples. Other labels are more ambiguous. "Bridge Opening" sounds like a news item. Will the general public know what "Road EIS Executive Summary" is? "Other Public Works" is also unclear; the link takes you to a list of national organization's web sites rather than nearby cities' public works departments, as users might guess. Ambiguous labels can generate confusion, which doesn't help create a positive impression about a site. Even when you think your

continued on next page

labels make perfect sense and can't be misunderstood, it may help to get some feedback on them, especially from people outside your agency.

Navigation Systems

A user dealing with ambiguous labels will also have problems navigating the site. Effective labeling systems work together with navigation systems to help users develop a mental map of a site so they can find the information they're seeking. A popular and useful method of helping users get around a site is a navigation bar.

A navigation bar is a set of related labels that presents the basic information hierarchy of a site. Using navigation bars consistently throughout your pages helps users understand where they are and where they can go from there. The City of Des Moines's web site (<http://www.ci.des-moines.ia.us/>) uses graphic and textual navigation bars to show users the main categories of information that can be linked from a given page. For example, clicking "Mayor and Council" on the home page will take you to a page with a photo of the mayor and city council and another navigation bar with links such as "Leave a Message," "Meeting Agendas/Info," and "Request to Speak." The navigation bar on the "Mayor and Council" page is a completely new set of links. Each link in this bar is the same color as the "Mayor and Council" button on the home page. This color consistency is a subtle hint to users that all the links with the same color are related. The graphic navigation bars are repeated as simple text links at the bottom of each page. This kind of redundant navigation system is helpful for a couple of reasons: (1) users who have graphics turned off in their browsers can still get around the site, and (2) visually impaired users who have screen readers to read aloud the contents of a web page also have full access to the site.

No matter who designs your site—someone in-house or an outside professional—your inside knowledge and input about the consistency, and especially the specificity, of labels and navigation systems will make all the difference to the user friendliness of your site. The next article in this series will discuss web site design.

"A user dealing with ambiguous labels will also have problems navigating the site."



Using navigation bars (left side) consistently throughout your pages helps users understand where they are and where they can go from there.

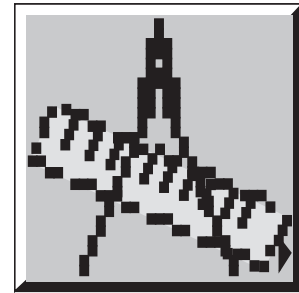
The previous three articles on this subject can be found in the preceeding newsletters, downloadable in Adobe PDF files from the web at:

www.dot.state.ak.us/external/state_wide/t2/news.html



Autodesk Systems Produces Diagramming Tool With Metric System Capability

Those involved in drafting projects will be interested in learning that Autodesk's Actrix Technical diagramming tool is now available in an international English version which provides the option of using metric ActiveShapes symbols that adhere to European standards. It also is available in German and French language versions. Actrix Technical software is interoperable with AutoCAD drawings, allowing those who do not use CAED software to communicate with those who do use it. For further information, phone (800) 964-6432 or access <http://www.autodesk.com>.



Yahoo for Metric

A leading Internet portal site, Yahoo, recommends a Science Measurement and Units resource entitled, *How Many? A Dictionary of Units of Measurement* at <http://www.unc.edu/~rowlett/units/index.html>, offered through the University of North Carolina at Chapel Hill. The site is also recommended by the Edinburgh Engineering Virtual Library and by Desk Reference. This site contains a dictionary with definitions of specific units and commentaries on SI units, metric prefixes, symbols and abbreviations, the spelling of units, and the state of the metric system in the United States.

The commentaries are largely pro-metric. Under "The Metric System" article, we read: "Those Americans opposing the adoption of metric units often argue that the metric system is abstract and intellectual or that its use would enbroil us in calculations. This is

not true. The metric system has been the customary measurement system in France for two centuries, the rest of continental Europe for at least one century, and in the rest of the world for at least a generation or two. Most people in the world know exactly how long a kilometer is, how large a liter is, and how much a kilogram weighs [sic], because they use these units every day of their lives in the same way Americans use miles, gallons, and pounds. Only in Britain and the United States does anyone need to convert metric units into something else. In fact, the way to avoid conversion formulae is to **adopt** the metric system."

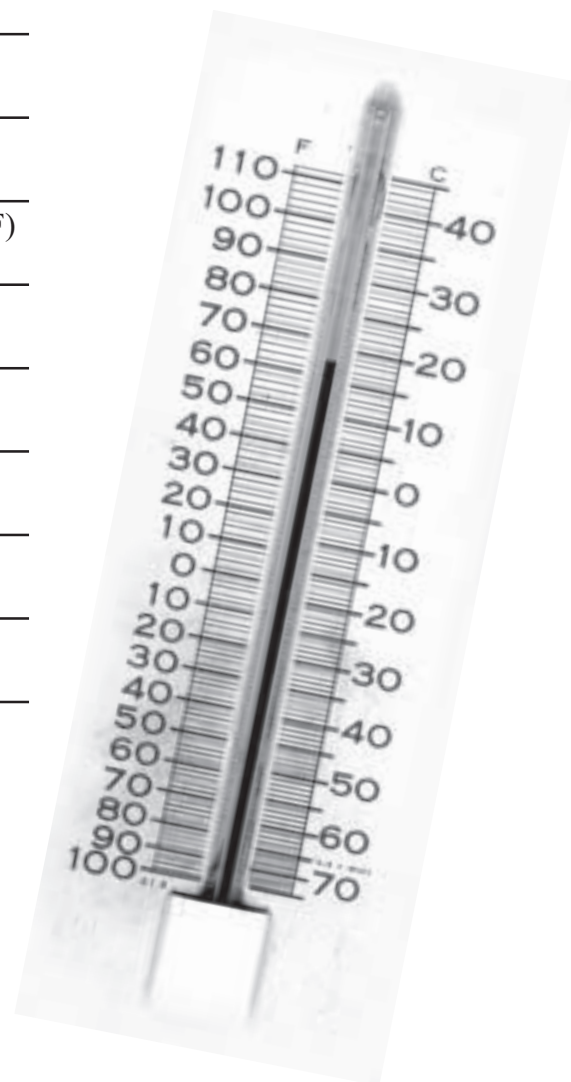


Better Acquaintance With Celsius Through a Series of Jingles

by George Sudikatus

Those who have a problem in remembering the amount of cold, warmth or heat reflected in degrees Celsius temperatures may find the following jingles useful.

-20° C	There is cold a-plenty when it's at minus twenty	(-4° F)
0° C	Fresh water will freeze at zero degrees	(32° F)
10° C	At ten you had better start wearing a sweater	(50° F)
23° C	It's okay with me when the room's twenty-three	(73° F)
28° C	A picnic is great when it's at twenty-eight	(82° F)
34° C	Hot weather's in store when it's at thirty-four	(93° F)
37° C	If you're lots over thirty-seven you may be in heaven	(98.6° F)
41° C	Stay out of the sun when the temp's forty-one	(106° F)
50° C	Hot water is nifty when it's no more than fifty	(122° F)
85° C	Most germs won't survive much above eighty-five	(185° F)
101° C	All the boiling is done at one hundred and one	(214° F)
200° C	Your bread will be toast by two hundred, at most	(392° F)



Meetings & Events

2001

Training (www.dot.state.ak.us, go to "World of DOT & PF", then click on "Training Opportunities")

Date	Event	Sponsor/Contact	Location
April 3-4	Rock Slope Stability Seminar	DOT&PF; Dave Stanley, 907-269-6236 or Simon Howell 907-451-5482	Westcoast International Inn, Anch.
April 4-6	NHI 13145—HMA Materials, Characteristics & Control	DOT&PF; Sharon McLeod-Everette 907-451-5323	Guesthouse Inn, Juneau
April 9-11	NHI 13145—HMA Materials, Characteristics & Control	DOT&PF; Sharon McLeod-Everette 907-451-5323	Westmark Hotel, Rampart Rm., Fairbanks
April 18-20	NHI 13145—HMA Materials, Characteristics & Control	DOT&PF; Sharon McLeod-Everette 907-451-5323	Regal Alaskan Hotel, Fairbanks
April 9-11	NHI 13053 – Bridge Inspection Refresher Training	DOT&PF; Simon Howell 907-451-5482	Guesthouse Inn
April 23-24, + indiv. mtgs.	Writing Skills Workshop DOT&PF employees only	DOT&PF; Simon Howell 907-451-5482	
April 24	Introduction to Mediation	UAA; Meg King 907-247-2791	Anchorage
May 3	NHI 137020—ITS Procurement	DOT&PF; Simon Howell 907-451-5482	O'Malley's on the Green, Anchorage
May 16-18	Demo Project No. 105, Advanced Transportation Management Technologies	DOT&PF; Simon Howell 907-451-5482	Anchorage
May 21-23	Demo Project No. 105, Advanced Transportation Management Technologies	DOT&PF; Simon Howell 907-451-5482	Juneau

* www.dot.state.ak.us/external/state_wide/T2/cal.htm

Meetings Around Alaska

Society	Chapter	Meeting Days	Location & Contact
ASCE	Anchorage	Monthly, 3rd Tues., noon	Northern Lights Inn
	Fairbanks	Monthly, 3rd Wed., noon	Captain Bartlett Inn
	Juneau	Monthly, 2nd Wed., noon*	Westmark Hotel * except June–Aug.
ASPE	Anchorage	Monthly, 2nd Thurs., noon	West Coast International Inn
	Fairbanks	Monthly, 1st Fri., noon	Captain Bartlett Inn
	Juneau	Monthly, 2nd Wed., noon*	Westmark Hotel * except June–Aug.
ASPLS	Anchorage	Monthly, 3rd Tues., noon	Executive Cafeteria, Alex Prosak, 562-3252
	Fairbanks	Monthly, 4th Tues., noon	Federal Building
	Mat-Su Valley	Monthly, last Wed., noon	Ah Sa Wan Restaurant Windbreak Cafe George Strother, 745-9810
AWRA	Northern Region	Monthly, 3rd Wed., noon	Rm 531 Duckering Bldg., University of Alaska Fairbanks Larry Hinzman, 474-7331
ICBO	Northern Chapter	Monthly, 1st Wed., noon	Zach's Sophie Station Jeff Russell, 451-5495
ITE	Anchorage	Monthly, 4th Tues., noon**	Sourdough Mining Co. Alex Prosak, 562-3252 ** except July & Dec.
IRWA	Sourdough Ch. 49	Monthly, 3rd Thurs., noon**	West Coast International Inn
	Arctic Trails Ch. 71	Monthly, 2nd Thurs., noon**	Oriental House
	Totem Ch. 59	Monthly, 1st Wed., noon	Mike's Place, Douglas ** except July & Dec.
PE in Government	Anchorage	Monthly, last Fri., 7 a.m.	Elmer's Restaurant
Society of Women Engineers	Anchorage	varies	Karen Helgeson, 522-6513



Negotiating Effectively a Priority at DOT&PF

Ninety employees at Alaska Department of Transportation and Public Facilities throughout the state are now armed with better negotiating tools and techniques. These workers, who negotiate construction project change orders and professional services agreements for a variety of studies, design work, and other services, participated in a two-day, hands-on workshop. By role-playing and handling situations that occur in their every-

day work life, these people learned how to prepare negotiating strategies as well as to approach a variety of negotiating positions with their opposition's potential point of view in mind. At the end of the workshop, it was apparent the participants realized that each side has its own pressures and deadlines, and that there are many ways to reach an agreement that allows each side to leave the table with a piece of the winnings in hand.



Left to right: Willie VanNostrand and Harold Henderson respond to Mike Tooley's offer.

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Web page: http://www.dot.state.ak.us/external/state_wide/t2/index.html



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